Here is my link for ordering Potato Onions Fall of 2024

Here's another source for true seeds.
Here's another possibility for finding Potato onion starts:
http://skillcult.com/blog/2012/10/06/where-to-buy-potato-onion-starts?rq=potato%20onions or check out this source https://www.youtube.com/watch?v=EMdFa6_FSgc

Booklet: Resurrecting the Potato Onion

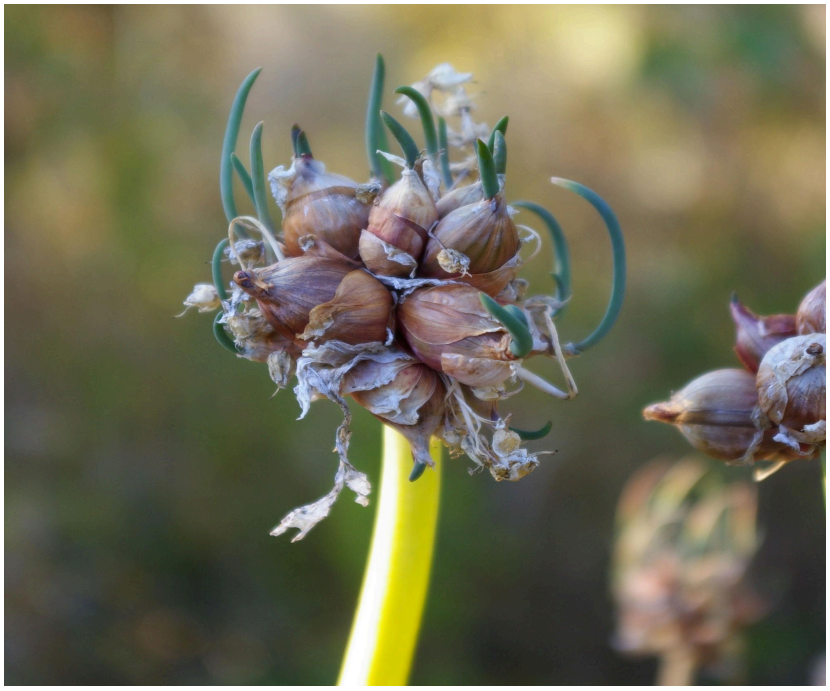
by Kelly Winterton

This is an attempt to summarize everything I know about raising, using and breeding Potato Onions. Because I am constantly learning more and more about Potato Onions, this booklet will probably never be finished. For this reason I am attempting to assemble it in Google's Cloud using Google Documents and sharing the access with anyone who has an Internet connection. This way, you can follow me as I work on my booklet, and I can use any computer that has Internet access to change and add at my convenience. (Start date of writing - fall 2011)

Just What Is a Potato Onion?

Usually, the first question I get is: What is a Potato Onion, and does it taste more like a potato or an onion?

Potato Onion is simply the common name for one type of multiplier onion. Another type of multiplier onion is the shallot. Potato Onions and shallots both multiply by root division and are classified as Allium Cepa Aggregatum. Egyptian Walking onions, (sometimes called tree onions), are also sometimes defined as multiplier onions, but are classified as Allium Cepa Proliferum. The walking type onions also multiply by root division, but differ from the Aggregatum group by forming bulbils instead of true flowers and seeds.



This is a type of multiplier onion. Pictured here is an Egyptian Walking onion, a type of topset onion.

Potato Onions taste just like any other onion, but do not look or taste anything like potatoes. The common name simply reflects their similarity to potatoes in the way they are planted and grown, and how they multiply. Potato onions and shallots are almost never multiplied by seeds, but must be multiplied by planting a bulb in the ground, much the same way you would plant a potato to obtain more potatoes.

Potato Onions In Past History

Potato Onions were once quite common, being mentioned in old gardening books of the 1800s.

(Do a search in Google Books for "Potato Onions.") By 1940 they had fallen out of favor, and became quite rare. Once a mainstay in many homestead gardens, they were gradually replaced by today's common onion, Allium Cepa, as modern transportation for shipping and grocery stores replaced the need for people to grow their own onions. The Green Revolution of the 1950s also dealt a blow to the popularity of the Potato Onion because modern agriculture and farming methods focused on the larger and more uniform size of common onions. Today, Potato Onions are grown only by a small percentage of gardeners who are interested in preserving this heirloom crop, or gardeners who appreciate how easy they are to grow. The origins of Potato Onions previous to 1800 are mostly unknown. Old books presume their origin to be the northern areas of Europe. One very interesting note by William Woys Weaver in his book Heirloom Vegetable Gardening, says the following: "The potato onion was introduced into England in the 1790s under the name Egyptian onion, a name also applied to tree onions in common parlance. *The Farmer's Encyclopedia* (Johnson 1844, 861) stated that the onion had been first introduced at Edinburgh by a certain Captain Burns, and for this reason it was sometimes called the Burns onion. There were two varieties, one that set bulbs on top like a tree onion, the other never sending up flowers."

Onions of Today

In backyard gardens, onions are *not* one of the more popular crops to grow. Gardeners shy away from growing them for a variety of reasons. Onions, if planted from seed, need a very long season of growth, often up to 120 days, in order to get a large bulb. If the natural growing season is not long enough, the seeds must be planted inside the house under grow lights or in a greenhouse as early as the first week of February, and then transplanted out to the garden later in the spring. Or, if the gardener chooses not to go the route of planting seeds that early, he might could purchase onions "sets" from the local garden center. Onion sets are actually dormant, small onions that will wake up and continue to grow once the gardener plants them out. Some people don't see the economy of "planting an onion to get an onion." Also, many onion sets give inconsistent results because they tend to bolt early and go to seed instead of producing a nice, large bulb for consumption. A third option, becoming more and more popular, is to actually buy onion seedlings from a nursery*, in the same manner one might buy a tomato transplant.

*Onion transplants, sold by the bundle

A fourth complication for backyard onion production is the fact that common onions are biennial. A biennial needs two full years to complete its life cycle, and won't produce seeds until its second season of growth. If the home gardener wants to save seeds, he would need to leave some bulbs in the ground over the winter season, waiting for the onion to re-sprout the following spring when it then will send up a seed stalk. After the seed stalk emerges and produces seeds, the onion will become inedible. So, most home gardeners either purchase fresh seeds every season, or else buy sets or seedlings every season.

Potato Onions, on the other hand, are super easy to keep and grow every season.

Supreme Sustainability

As mentioned above, Potato Onions were once a common vegetable grown on many homesteads. Potato Onion bulbs were shared between neighbors and relatives, and even passed down from father to son. Once you had a few bulbs to start your own supply, you could keep perpetuating them into futurity, never running out - unless some calamity caused you to lose your starts for the next growing season. If, for some reason, you lost the ability to start your next season's Potato Onion crop, say for instance a flood in your cellar where your bulbs were stored, you could always obtain another start from a brother, uncle or neighbor.

I acquired my my original yellow Potato Onion starts from Ronniger's Seed Potatoes approximately 20 or more years ago, and haven't been without them since, never needing to purchase or acquire more. This is what I call sustainability, because you never kill your "goose

that lays your golden eggs."

When you harvest your Potato Onions in the fall, it is a simple matter to set aside the very best bulbs and reserve them as planting stock for the coming spring. These bulbs will store very well in a dark, cool and dry place. I often see bulbs store easily for a full 12 months without any special storage conditions. The remainder of the bulbs can be eaten as needed.

Each bulb, replanted in the spring, will multiply out to give you from three to seven more Potato Onions. I have found that I can reliably count on a five-fold increase each year.

The Potato Onions themselves are used in the same manner one would use any other onion. The taste is the same, except for maybe a little more pungent. The only other difference in use is that the Potato Onions themselves are seldom larger than three inches, while your common grocery store onion is twice that large. Sometimes it is even advantageous to have a smaller onion to begin with, with many recipes calling for only a half of an onion; whereas one Potato Onion will be just the right size!

How to Plant Potato Onions

The biggest question, even among people who are experienced in growing Potato Onions is: Do you plant the starter bulbs in the fall or in the spring? The simple answer is either. The more complicated answer is which is better? I have tried both fall and spring plantings, and I much prefer to spring-plant them. Your own situation might be different and you might prefer the fall planting method. I will try to analyze the reasons and advantages for both methods.

As I mentioned earlier, information on the Internet about Potato Onions is pretty thin, and sometimes contradicts itself. But, one rule of thumb that many seem to agree on is that fall planting vs. spring planting depends upon what zone you live in. Supposedly warmer zones, zone 5 and warmer, should plant in the fall, whereas zones 4 and colder should plant in the spring. I'm not totally sure of all the reasons for this line of thinking, except for a couple of websites which claim to get larger final yields when fall-planted vs. spring planted. Here in my northern Utah mountain valley of zone 4, (the most recent, updated USDA zone maps of 2012 now have me placed in zone 5) I have never seen any increase of yield in fall planting over spring planting, so I doubt this is totally true*. The other reason for spring planting in colder zones is that supposedly the cold winters can kill the over-wintering bulbs.

*(A note to myself here - some sites and sources claim that by planting a small bulb, that small bulb will only grow into one large bulb during the growing season. While I have never experienced that to be the case with my Potato Onions, I can imagine that *IF* that small bulb had been fall-planted, and then had the chance to start some growth before the dormancy period of winter, that small bulb *might* have had the chance to start multiplying itself out in the following spring and summer growing season.) **(One possible strategy here might be this: When harvesting your bulbs in the fall, the smallest bulbs of the**

harvest might be fall-planted, and reserving your bigger bulbs for storage. During the winter, you could then eat the large bulbs, and reserve the largest bulbs for your spring planting.)

If the above two reasons are valid, I would like to propose that spring planting, even in warmer climates, should be every bit as good, if not better, than fall planting. I suspect that old traditions are held close, and will die hard until proven one way or the other. Like is commonly stated, "your own mileage may vary."

One of these "old wives' tales" for fall planting probably arose from the need to store the bulbs through the winter before the days of electricity and modern living accommodations. If bulbs were harvested in the fall and then stored in a cellar, barn or other place, they may have been susceptible to spoilage or rodents. Using Mother Nature, 19th Century farmers and homesteaders may have chosen simply to store them right in the ground. They might have been able to continue to harvest right from the soil during the colder winter months. The bulbs that awoke from dormancy in late February and early March could be eaten as onion greens even before other green foods started growing. After a long winter of eating jerky and potatoes, I can imagine those early green onion shoots may have been very refreshing! Or, Potato Onions might just have been grouped together with other crops that are commonly fall-planted, like shallots and garlic.

But, Potato Onions are a quick-maturing crop. If I plant my Potato Onion bulbs into the garden the first or second week of May, they are fully grown, died-back, cured and ready to store by the first week of September. Because they mature so quickly, I do not see the value of getting them into the ground extra early in the spring or even trying to get them into the ground the fall before. A late spring planting gives you plenty of time to harvest and store your bulbs away even before the first frost of autumn.

(Another side-note here: spring planting, even ***if*** it gives slightly lower yields than fall planting, will still give you the most "bang for the buck" because you are only tending your crop for four months, not ten months.)

If you live in a warm climate, and want to fall plant like the old-timers did, I *can* think of one advantage. This might be to fall-plant part of your bulbs for consumption as a first crop, and then part of your bulbs could be spring-planted for consumption as a second crop. This might could give you two crops per year.

(Is your growing season long enough to give you two crops per year? Mine is not. Another unanswered question for me is if these are day length-sensitive. If they are **day length-sensitive**, it may not be possible to get two crops per year.)

But I have three additional reasons to believe that spring planting is still a better method - regardless of what your climate is like. The first reason is that I believe some of the diseases that attack Potato Onions are soil-borne, and the longer the bulbs are actually sitting in the soil can increase the possibility that your Potato Onions might suffer from them. I will go into this

subject more deeply in another section later on.

The second reason I believe that fall planting is not as good as spring planting is because I believe that bolting and flowering can be stimulated by the overwintering process (especially cold and damp conditions during early spring growth). Many people look upon the flowering of their onions as a disadvantage. I will also go into this subject more deeply in another section later on, because there might be circumstances when you might actually want to have your Potato Onions produce true seeds.

The third reason I prefer spring planting is that I can watch my bulbs through the winter. As I go to the basement to pick out an onion for eating or cooking, I can glance through each of the bulbs. If I want a small onion, I can find me a small one. If I want a large onion, I can find me a large one. I can also sort through, looking for the very best bulbs, which are reserved as my planting stock for next spring. If one of the bulbs starts to sprout while in storage, it is culled by eating it. In this process, I am constantly culling and therefore selecting for the very best and healthiest planting stock for next season. This selection process is ongoing throughout the winter months, selecting for color, size, store-ability and disease resistance.

(This note added in 2017: I have since discovered new information on the spring vs. fall planting dilemma. This seems to answer the conflicting information of the old books of the 1850s. It is my experience that some varieties do *not* store well, while other varieties *do* store well. The reds and the whites, in my experience, will not usually store well at all, while the yellows and browns do store well. Therefore, whether you plant in the fall or in the spring might very well come down to whether you have a variety that stores well or not. If your particular Potato Onion variety does not last in storage, it should be fall-planted. If your Potato Onion variety, however, does do well in storage, spring-planting might be advantageous.) (This also seems to answer the question about why the reds and the whites seemingly became so rare or extinct, leaving only the yellows to be commercially available by the year 2000.) (**New note late fall 2018 - after years of breeding and selecting, I now have a really nice red variety that has excellent storage traits, my new Garnet Mountain.)**

The decision to plant in the spring or in the fall is the hardest part of the planting process. You will find the rest of the process to be simple. The bulb itself is planted in a hole with the top of the bulb just barely under the surface of the soil. I plant each bulb one foot apart. That really is all there is to it!

I have read arguments on how deeply they should be planted. Some sources say to leave the top of the onion exposed, other sources say to bury the tops. If you are spring planting, the depth really doesn't matter. But if you are fall planting, the top of the bulb should be just under the surface so the winter rains and snows do not unnecessarily expose the bulb through erosion or frost heaving.

The bulb itself will sprout reliably regardless of planting depth, once its roots are put into contact

with the moist soil. Even if the top of the bulb itself is under an inch of soil or totally exposed will, in the end, make absolutely no difference.

As the starter bulb sprouts, it will send up multiple shoots from the mother bulb. The mother bulb will decompose and the new nest of Potato Onions will begin to grow. As the new nests of onions form, they will form at the depth they want to be at - not at the depth you planted the mother bulbs. Regardless of planting depth, the nest *always* forms at the soil surface.

As the nest of new onions grows, they will actually “float” to the surface as they expand and push away the soil.

New shoots emerging from the mother bulb

You can actually count how many new bulbs will form from the mother bulb by looking down from above. This mother bulb will form at least four new bulbs.

As you can plainly see from looking at the top view of the mother bulb sprouting, the amount of new baby onions has already been predetermined by the mother bulb's previous season of growth. I believe it is a logical and easily prove-able conclusion that a mother bulb will give birth to the same number of daughter bulbs regardless of whether it was planted in the fall or in the spring.

The picture below will plainly show the number of bulbs you can expect to harvest next year. This potato onion, by the way, had been on my basement shelf for almost 13 months, and this is why the bulb divisions have started to turn green.

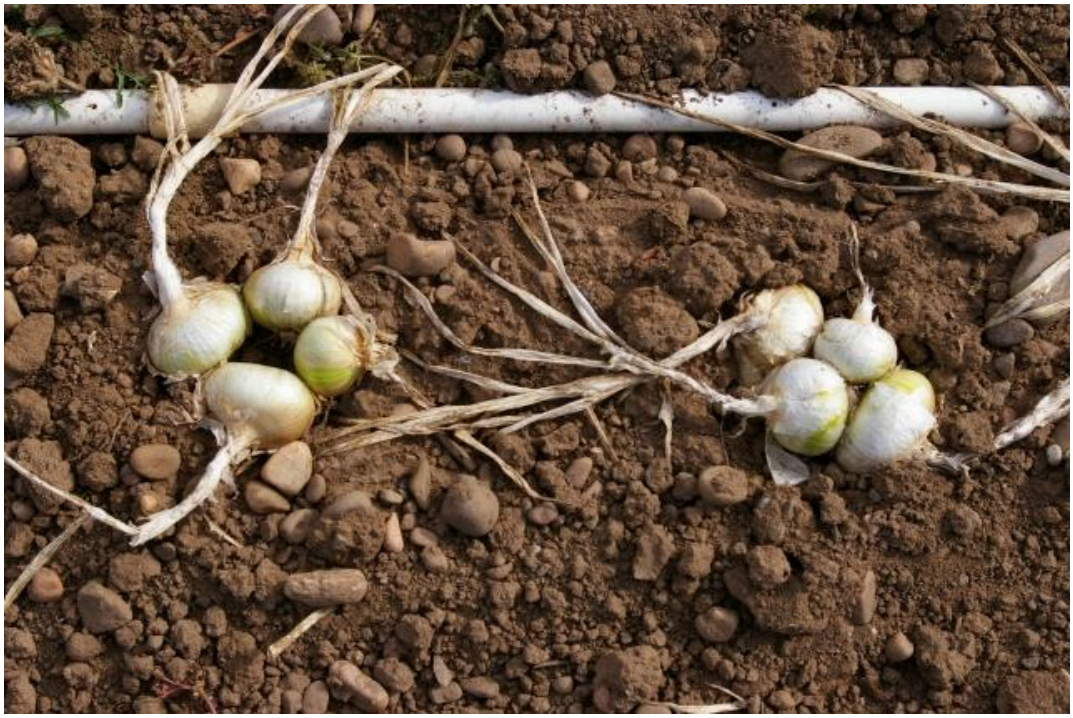
This bulb is already 13 months old, so you can see how well these hold up in storage. After 13 months, the bulb is anxious to wake up and grow again, so the divisions are turning green. It is very plain to see that if you planted this bulb, it would give birth to five new bulbs in the next growing season. (I actually ate this 13 month-old onion after photographing it - it was great!)

There really is no complicated science involved in the planting and raising of Potato Onions. They will do well regardless of the timing of planting or the method of cultivating.

Below is a picture of my planting and growing method.

Potato Onions in a row, spaced one foot apart, watered by a PVC pipe with holes drilled in bottom. I have been pleased with this method.

Potato Onions are edible in all stages of their growth. You can start eating them from the garden as needed. But, if you want to harvest your onions for long storage, you will need to leave them in the garden soil until the tops die down and dry out. By sometime in August, you will notice the tops beginning to flop over and die back. You may cut back on your irrigation at this point to let them die back naturally. You actually want them to die back, so the necks can dry out. The drier the necks can become, the longer your bulbs will last in storage.



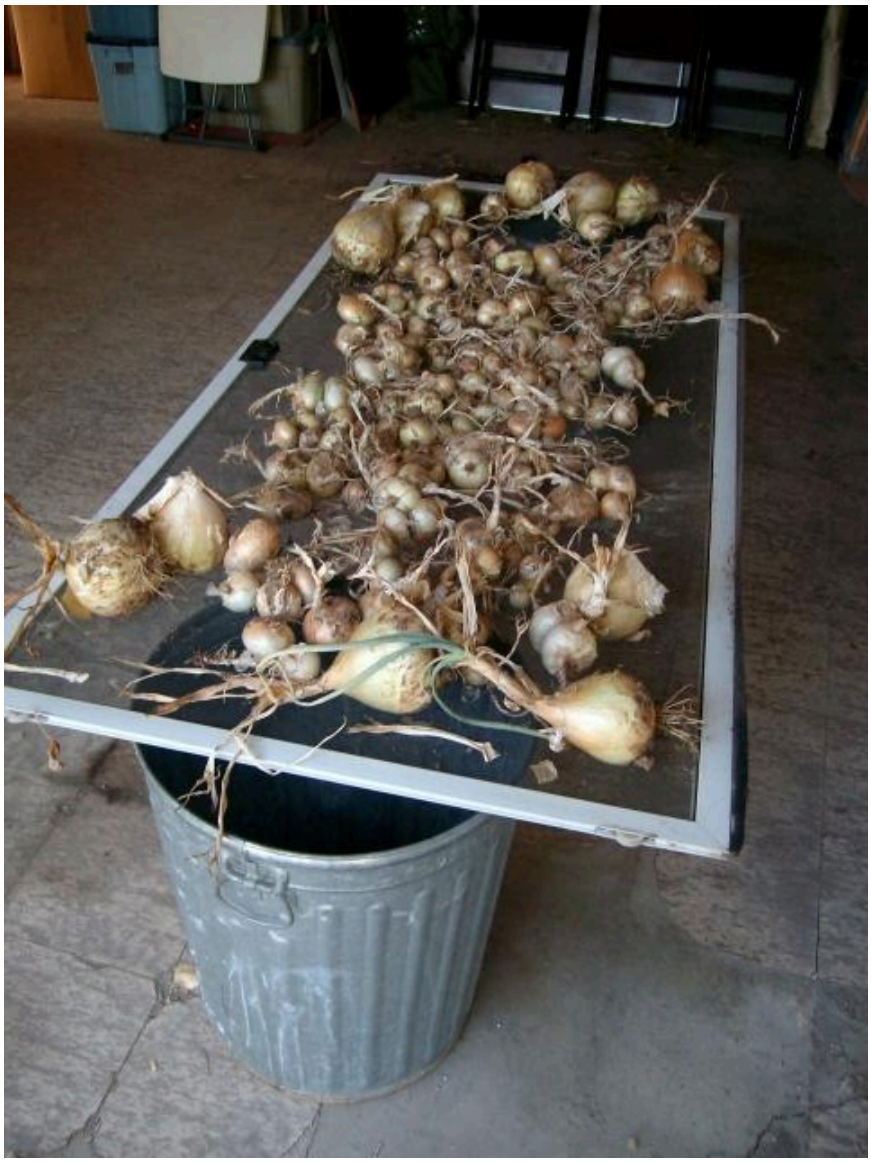
Your Potato Onions will look like this in September after the tops die down. These are ready to be harvested. These are my Green Mountain variety - you can see the greenish tint.

Harvesting and Curing the Potato Onions

After the tops die down to resemble the above picture, you can see just how easy these will be to harvest. Usually, only your fingers are necessary to pull them from the ground. If any implement is needed at all, it will only be a garden trowel.

At this point, however, you cannot rely on Mother Nature to have dried them out completely. While in/on the ground, they can come into contact with moisture in the soil, or have dew condense on them every morning, or even get rained on. In order to ensure the skins and necks are dry, you need to lay them out on a screened surface in a garage or shed for a couple of weeks. In a garage or shed, they will be protected from any dew or rain while completing their drying process.

After drying in the garage, you can rub off any soil and loose skins, and place them right into your storage area, preferably a dark, cool room - perhaps in a basement. I made some screened shelves specifically for this purpose, but you could also have good success by hanging them in mesh onion sacks.



Final drying/curing rack in my garage. It doesn't need to be complicated. (I have devised a new type of drying rack. If you are interested, see my 2013 gardening journal. Link is at end of this booklet.)

Early Experiments

My first Potato Onion starter bulbs were mail-ordered from Ronniger's Seed Potatoes about 20 or more years ago. In my early years of gardening, just the attempt to grow Potato Onions was "an experiment." I didn't know anything about them and ordered them out of curiosity. I was specifically looking for something unique and sustainable. The idea of growing something that was rare was also appealing. Back in those days, the Internet didn't exist yet, or if it did, I didn't use it. The only information I could find about Potato Onions came from the short description in

a seed catalog.

So you can understand that just ordering and planting these was an experiment for me. I didn't know if they'd even grow and perform for me in my zone 4 mountain valley or not. I planted them in the spring, harvested them in the late summer, and ate them in the depths of winter. All was well, and I was quite pleased. I was especially impressed with how well they lasted in storage.

The first ten years or so, my experience with growing Potato Onions was pretty uneventful. I understood these were all clones, but was still surprised to see every nest of onions in the row to all be the identical height. Even the tops all flopped over and began to die back at the same time.

After about ten years of successful growing, I wondered if fall-planted bulbs could successfully overwinter in my cold climate. To test out their cold-hardiness, I fall-planted some Potato Onion bulbs in a seldom-used flower bed in my front yard. The following spring, they all sprouted and started to grow normally. My question was answered affirmatively - yes, the bulbs are indeed winter hardy in zone 4.

That same spring, I also spring-planted my normal Potato Onion crop in my backyard vegetable garden. The Potato Onions in my vegetable garden were watered and fertilized regularly, while the over-wintered Potato Onions in my front yard flower bed were often neglected. I didn't need to care for the overwintered Potato Onions in my front flower bed, because for me the overwintering experiment was over.

But, I was totally surprised to see ***every*** nest of neglected onions in my front flower bed send up a seed stalk, yet ***none*** of the spring-planted bulbs in my back vegetable garden had seed stalks! In my previous ten years of growing Potato Onions, I had never seen even a single flower stalk. My obvious conclusion was that the overwintering process had stimulated them to go to seed.

Being a member of the Seed Savers Exchange, saving seeds was second-nature to me. I saved some seeds from the Potato Onion flowers.

(I never took a picture of this flowering event back then, but a gardener in New Jersey sent me a picture of his Green Mountain Potato Onions that are going to seed in his garden. His picture is just like what I experienced, and he has given me permission to share his photograph in this booklet of mine (below). He planted starter bulbs of my Potato Onions in the fall of 2011, and they put on growth over the winter which resulted in all these flowers in the spring of 2012. This is further confirmation that one of the triggers to flowering lies in the growth during cold and wet weather.)

This is a picture of from a gardener in New Jersey showing how his Green Mountain Potato Onions are experiencing a mass flowering event. I include this picture as a representation of what my original mass flowering event looked like about a dozen years ago.

More Early Experiments

The following year, I planted those true Potato Onion *seeds* in a row right next to my normal

Potato Onion *clones*. I wanted to be able to watch each row side by side and compare results. The row of my normal Potato Onion clones performed exactly as they had the previous 11 years, but the row of Potato Onions from seed did not look anything like the row of clones from bulbs.

In the row of seeded Potato Onions, I had a lot of diversity in phenotypes. I had onions with tall top growth and I had onions with shorter top growth. Even the green color of the tops varied slightly from plant to plant. This row was acting like an F2 generation, expressing a myriad of phenotypes. But, there was one huge difference - none of the onions from seed were creating the normal “nest” of onions. All the bulbs were singles or doubles. And these single and double bulbs were at least 3 to 4 times larger than the control row of Potato Onions planted from bulbs!

I really had no idea what was happening! I explained my experiment with true Potato Onion seeds to Jerry Goodspeed, the County Extension Agent in Weber County. I had taken the Master Gardener Course from him previously. But he just shrugged his shoulders. He had no experience with Potato Onions.

I was encouraged, though, to press on with my experimenting because of the sheer size of the onions from true Potato Onion seeds. My original line of thought was that I could fall-plant Potato Onions which would trigger the flowering response, collect seeds, and then use the seeds to grow extra-large single and double bulbs that perhaps would store well up to a year. That is, *IF* they stored well, they could store even better than normal storage onions. Time would tell me if my large single bulbs would even store as well as my small cloned bulbs.

Now you can understand why I thought I could grow extra-large storage onions by using true Potato Onion seeds. Their size in their first year of growth from seed is quite large. But, I rarely got my Potato Onions to produce true seeds. Once these large single bulbs are re-planted next season, they divide and multiply asexually, but the bulbs are then smaller. This picture was taken in the fall of 2011, but is representative of what I saw back a decade ago in my first experiments.

Well, the large bulbs from seed stored very well indeed. I was excited that I could produce storage onions the size of a normal grocery store onion. Perhaps if someone could reliably get Potato Onions to produce seeds, such a concept could be revolutionary?

Experiment Continued, Next Growing Season

The following spring, I took the large bulbs grown from seed and selected the very best-looking bulbs for planting. I also planted another control row of the original Ronniger's Potato Onion bulbs I had been growing for the last dozen years.

The control row, again, was exactly like every other year. But, the large single bulbs started to divide and form nests. Now, it was starting to make sense to me! After all, onions are biennials. First year from seed will make a single bulb, and the second year it will divide and make a nest.

After dividing and nesting, the new daughter bulbs were not as large as the huge mother bulb from seed was. But, the size of the nested onions was still three times as large as the original Ronniger Potato Onions I had started with!

I now wish that in those early days, I would have had the foresight to take some pictures. But I really had no idea that this would go as far as it has. I only took one picture back then; you can see it below.

At the left are the original Potato Onions from Ronniger's that I grew for a dozen years. At the right are what I ended up with after a couple years of breeding from true seeds, culling and selecting. The increase in size and change of color is apparent.

The experimental row still had a lot of different phenotypes. Some had enormous top growth, some sent up flower stalks, some nests had large bulbs, some had smaller bulbs. Some nests had only 3 or 4 bulbs, and other nests had 5 or 6 bulbs. I selected some of the best bulbs from the best nests and set them aside for next year's planting stock, and culled the ones that didn't show as much promise by eating them.

After a couple years of further selection, I became so pleased with my new Potato Onions, that I completely quit growing the old Ronniger's strain. Being quite proud, I wanted to name my new variety. I gave it the name of **Green Mountain Multiplier** so that it would reflect its place of origin, which is Mountain Green Utah.

Since it now had a name, I wanted to document how I developed my new variety in case anyone had the desire or need to know. I wrote up a short paper, took a picture, and placed it on the Internet for the world to see.

I have been surprised and even flattered by the number of people who have found me on the Internet and had the courage to ask for some starter bulbs from me. I even sent some bulbs to England and Spain! I shared what few I could spare and found out that others also had good results from my new Green Mountain variety of Potato Onions.

Attempting To Obtain More True Seeds - Failures

After putting that short paper on the Internet about how I developed my new Green Mountain Multiplier onion, I was contacted by Geoffrey Larbalestier. Geoffrey is a geneticist in England, and an avid gardener. Geoffrey was interested in Shallots and Potato Onions, and specifically how to stimulate them to flower. When he read my paper about how I got ALL my Potato Onions in my front flower bed to go to seed, he wondered how I did it.

I told him simply that it was the overwintering process, and I should be able to duplicate it. But, my continued attempts to stimulate flowering and obtain more true seeds were basically failures. I have never since been able to get ALL my Potato Onions to flower like I did that one year. (I experienced another mass flowering event in the 2012 season, as described at the end of the booklet.) I have, since then, had a few bulbs throw up a flower stalk, but if there aren't enough other Potato Onion flowers for cross-pollination, the small specks of black seeds in the flowers are sterile. It is commonly accepted that onions, in general, are largely self-infertile, needing to be pollinated by another onion flower to produce good seeds. And to complicate the issue, onion flowers are not very attractive to pollinating insects. (It seems this trait of self-infertility comes from the tendency for the male Stamen to develop before the female Pistil. Thus, the Pistil must be pollinated by pollen of a nearby flower that has viable pollen.) *(I am now able to consistently produce new seeds each year. 2013 to present.)*

Geoffrey had found a PDF from the University of Hannover about a research project that studied how to stimulate flower production in Shallots. He asked me to translate it, which I attempted. (I am quite fluent in the German language.) But after translating seven or so pages, I found that it switched to English. The first few pages in German were mostly just a summary and introduction of the rest of the research paper, which was in English. If you are interested in reading it, just skim past the German pages until you get to the English portion. There is nothing in the German that isn't repeated in the English.

Some Highlights of the University Study

The research paper was about shallots, but I have found many similarities to Potato Onions. (I

now believe shallots and Potato Onions are one and the same 2015) (Both shallots and Potato Onions are Cepa Aggregatum.) The research into what stimulates shallots to produce flowers and seeds is important for **three** reasons:

1) Commercial growers of Shallots need a large number of mother bulbs to plant their fields. These mother bulbs must be stored in carefully climate-controlled conditions to ensure they will be in optimum condition for planting, because shallot bulbs do not store well. For example, the study says it takes 1.2 tons of shallot bulbs to plant one hectare (2.47 acres). That would be a lot of shallot bulbs for a commercial grower, making the storage of these bulbs a major issue. But if the grower could grow from seed instead, the need to store bulbs is eliminated.

2) Storing bulbs can perpetuate diseases from generation to generation, especially Fusarium fungus and various latent viral diseases. These fungal and viral diseases not only are perpetuated, but can accumulate and increase over time. These diseases reduce both yield and size of the bulbs. But by using a seed, all diseases are eliminated in the next generation.

3) When shallots produce flowers and pollen, it is then possible to hybridize new varieties of shallots. Currently (at least as of December 2004) there is only ONE variety of shallot being grown commercially. There are, however, other varieties of shallots being grown on a smaller scale by smaller growers. New and improved varieties could be welcomed by commercial growers, seed companies and gardeners alike. New varieties might could show resistance to disease and also introduce some hybrid vigor.

The study also pointed out some other interesting tidbits that I find interesting and possibly meaningful to my own comparisons and observations with Potato Onions.

- Shallot plants that are grown from true seeds have more of a propensity to flower than do shallot plants that are grown from bulbs. Also interesting is that the more generations of asexual reproduction the mother bulb has been through, the less likely it is that it will respond to stimuli needed to flower. (In other words, a shallot that has already been cloned for many years will be less likely to flower.) This is perhaps what led William Woys Weaver in the Kitchen Gardener Magazine #26 of April 2000 to claim that *"shallots have been developed from clones for such a long time that they have lost the ability to produce flowers. Or, if they do blossom, the flowers are sterile."* The study also says that shallot plants grown from seed which do flower have more florets per umbel (larger umbels), but shallots from bulbs will have more (smaller) umbels.

- The stimuli studied were mainly the manipulation of temperature and day-length, but these are not the only stimuli needed to invoke flowering of shallots. It was stated that the flowering response is a "multi-sequential process of specifically ordered events," such as age of the plants at time of stimulus, fertility needs during specific time periods, and even nuances of a circadian clock mechanism within the plant.

- Shallots grown from seed mature at a different rate than do shallots grown from mother bulbs. Seed-grown shallots might need as many as 184 to 224 days to mature, while bulb-grown shallots might only need 101 to 156 days to mature.

- Shallot varieties that have been selected for their resistance to bolting also exhibit a greater resistance to being induced to flower by the same stimuli used to successfully get other varieties of shallot to flower.

- Even when shallots do flower, only about 25% will set seed, even when hand pollinated.

- The success of stimuli on the shallot plants will depend upon the age of the plant. Shallot plants in the juvenile stage can never be stimulated to flower, but plants past the juvenile stage are receptive to stimuli needed for flowering.

- Flowering can divert energy away from the developing bulb.

All of these above points in the study of shallots also have relevance to my own theories in Potato Onion seed production, and that is why I take the time to mention them here.

I am currently (spring 2013) coming to believe that taxonomists were correct in placing shallots and Potato Onions in the same Aggregatum group. I now believe that Potato Onions and shallots are indeed the same, but differ in their characteristics of taste and storage ability. I believe Potato Onions are pungent and long-storing, while shallots are milder and poor keepers. But, I believe that genetic variations could and would produce bulbs that are in between these two extremes also, i.e., a milder but shorter-storing Potato Onion or a more pungent and better-storing shallot. In the coming growing season of 2013, I am going to grow some shallots in order to evaluate this theory.

Utah's State Flower - The Sego Lily

Sego Lily

At this point, I'd like to take a small diversion to tell a story about Utah's state flower, the Sego Lily (Calochortus nuttalli). This bulbous lily is native to the Western United States. It grows in dry, well-drained soils. It is perennial, but the bulb can lie dormant under the soil at depths of 4 to 5 inches for many months, often never even having any top-growth until conditions are just right. Many years, there are none to be seen growing above ground. Having lived in Utah for the last 45 years of my life, I have only ever seen two Sego Lily flowers. I actually thought the Sego Lily was extremely rare. *(In 2014, I observed quite a few Sego Lilies in Montana.)*

The Sego Lily is a very important part of Utah's history. The Mormon Pioneers travelled west to find themselves a place they could call their own and worship without persecution. When the first wagon trains arrived in the Salt Lake Valley in July 1847, it was too late in the summer to plant many crops. The Pioneers had little food to get them through that first winter. The native American Indians taught the pioneers how to find the Sego Lily bulbs and eat them. Brigham Young, the prophet-leader of the pioneer settlers even proclaimed that without the Sego Lily, most would not have survived through the first winter.

As I was a younger man hiking and camping in the outback of Northern Utah, I had often wondered if I could find a Sego Lily and eat it. I also wondered how the Mormon Pioneers had even been able to find so many to eat in the first place because they were so rare. (I never touched, let alone ate either of the two Sego Lilies I have seen.)

Two years ago, I met Bill Varga. Bill was the Utah State Extension agent at one time, but is now enjoying partial retirement from his work at Utah State University. Bill was very interested to hear me explain my Potato Onion story to him, especially how I was trying to find some of the stimuli involved in getting flowers and seeds. Bill very politely asked me if he could now tell me *his* story. I was, of course, very interested also to hear his own story.

He told me that since his formal retirement, his passion has been to study the flowering habits of Sego Lilies. He told me that Sego Lilies also seldom produce flowers and seeds. He has

searched his secret haunts for many years to watch places where he knew there were a few Sego Lilies. One year he went to a hillside where he previously had seen a few Segos, but this particular year he went to that same hill and saw literally multiple thousands of Sego Lilies in bloom. Apparently, the thousands of Segos had always been there under the soil, but were invisible because they were dormant, or at least not producing flowers.

Bill told me that you'd think that they would be able to determine what stimulated them to go to flower that year because it would be possible to go back in time and track the temperatures, moisture levels and any other pertinent condition. But Bill said that it is still a mystery to botanists as to why some years they flower and most years they don't. He told me that Mother Nature just has way too many factors that have to fall into place before they want to produce seeds, and that my Potato Onions were probably no different.

This is, by the way, a real faith-promoting story for Mormons, because the pioneers were blessed to have thousands upon thousands of Sego Lilies blooming right at the time they needed them to survive.

I guess I saw my "once in a lifetime" flowering event happen to me also a dozen years ago when every Potato Onion in my front flower bed went to seed.

My Own Theories As To Why Potato Onions Seldom Flower

* (This theory needs some updating, but I am leaving it as is for the time being. What I wrote has value, but needs amended.)

In my correspondence with Geoffrey Larbalestier, and reading through the PDF of Hannover University's research, I came to the conclusion that there must have been more than just temperatures and day-length involved in making my Potato Onions all go to seed. The reason for this conclusion was because I had two beds of Potato Onions that year, the front bed produced flowers and the back bed did not. These two beds had experienced the same temperatures and day-lengths, but there were two other differences - 1) the front bed was fall-planted, and 2) it did not receive regular irrigation or fertilization. The back bed, however, was spring-planted in rich soil and received regular irrigation.

The Hannover study seems to support my conclusions. By fall planting, my bulbs awoke from dormancy early in the spring, while there were still many cold nights of frost. The study shows that cool temperatures after the plants pass their juvenile stage can be a key stimulus for flowering. The study also notes that lack of fertilization and irrigation at a key period of growth can also influence flowering. It is a widely-known fact that many types of plants will bolt as soon as they encounter some stress.

But, in the succeeding years of attempting to obtain more true seeds, I have been largely

disappointed, unable to duplicate that first event. The only time I have been able to obtain enough true seed from flowering Potato Onions was the 2010 growing season when I was able to get a total of SIX Potato Onion flowers, from which I collected approximately 40 seeds. These 40 seeds were successfully grown this year (2011) to give me very exciting results! (More about that later on.)

So, like the Hannover study and Bill Varga suggest, the exact processes and stimuli involved are probably known only to Mother Nature. I believe there could be as many as six or seven factors that must come together in sequence before a mass event like the one I saw a dozen years ago can recur.

Another Key Theory of Mine*

* (This theory needs some updating, but I am leaving it as is for the time being. What I wrote has value, but needs amended. I update this theory at the next * asterisk.)

All of the fruits and vegetables we currently grow in our gardens and purchase in the grocery store have ancestry that goes back thousands of years to some wild form. That ancient, wild form was probably much smaller and less palatable than the varieties we have become accustomed to eating today. For example, I grew some Indian Corn once, and tried to eat it like sweet corn right off the cob. Wow, I could hardly eat it! Modern sweet corns have been bred to taste as sweet as candy; in fact, Gurney's even sells a variety named Kandy Korn. We owe a great debt of gratitude to ancient cultures who diligently bred ever-more succulent and delicious varieties from those wild ancestors.

We have established the fact that Potato Onions rarely flower and produce seed. But this raises in my mind another interesting question: if Potato Onions rarely flower, how did they evolve from their wild, indigenous form to a viable, delicious and useful crop?

What might an ancestor of today's Potato Onions have looked like back in the days of Christ? Or the days of Cavemen? And how might Mankind have bred those ancient Multiplier Onions into today's Potato Onions unless they flowered and made seeds?

The answers to those questions are probably not going to be discovered. Those answers are probably lost in ancient history. Even the old gardening books of the 1850s speculated on their origin. Since those questions will not be answered anytime soon, I would like to propose my own personal theory as to how and why the modern Potato Onion has evolved into the form that we have today, yet rarely flowers and produces seed.

To illustrate my theory, I would first like to tell you about my two backyard flocks of chickens.

About 25 years ago, I started my hobby of raising chickens. Back then, I had big dreams of living more sustainably. I wanted not only to eat a few fresh eggs, but I wanted to have a self-sustaining flock where the hens would sit on a clutch of eggs and hatch out their own little chicks. My first little flock consisted of three Barred Rocks, three Rhode Island Reds, three White Leghorns and a Silver Wyandotte rooster. After a couple of years, I wondered why none of the hens ever hatched out any eggs.

Sadly I learned that the broodiness of hens had been “bred-out” of them more than a century ago. I also learned that in order to get more little chicks, you had to incubate the eggs yourself in an incubator.

This was so disappointing to me that I built another coop so I could raise some Bantam chickens for the sole purpose of watching a Banty hen sit on and hatch her own eggs. (Bantam chickens have not had the broody instincts “bred-out” of them.)

How then did laying hens evolve in their history to suddenly have no brooding instincts anymore? The answer is really very simple.

During the early 1800s, almost every homestead had a flock of chickens. But as modern transportation and the advent of grocery stores came along, eggs became a commodity that were transported and sold to city dwellers. Egg farmers noticed quickly that some hens produced more eggs per year than other hens. So to increase his efficiency, he culled the less-productive hens and bred the best layers.

But, in the process of breeding for the highest maximum output of eggs, the farmer was also inadvertently selecting for hens that didn’t go broody. You see, when a hen goes broody and decides to sit on her eggs to hatch them, she quits laying eggs during this broody period. A broody hen was not in the best interest of the farmer who produced and sold eggs.

It didn’t take but a couple of decades before laying hens no longer had any interest in hatching their own eggs. No problem, though, because by this time technology rescued the poultry farmer with the invention of incubators. In fact, a whole industry of hatcheries and nurseries sprang up.

I suggest the history of Potato Onions is similar.

I propose that the ancient, wild Potato Onions threw up flowers and seeds quite regularly. But, I also propose that those ancient multiplier onions were less tasty and less productive. But, undoubtedly, mankind recognized their multiplying trait and started to cultivate them. I even imagine that mankind even played with the gene-pool by hybridizing them, quite innocently. I can picture in my mind’s eye the royal garden of some King or Prince where there were assorted types of Potato Onions growing so his royal chef could create different flavors by using

different types of Potato Onions. It is not difficult for me to envision different varieties of Potato Onions hybridizing themselves when they are grown right next to each other in the same garden.

I assume the next step happened just like my chicken story. I assume that some Potato Onions yielded larger nests of bulbs, and so the most productive Potato Onions were perpetuated, and the less productive Potato Onions were culled. But, undoubtedly, the most productive Potato Onions were also the ones which devoted their energies to producing more bulbs and NOT more flowers. (The flowering process can divert energy away from bulb production and into flower production instead.)

But, since gardeners could clone their improved and more productive strains of Potato Onions asexually, there was no need to reproduce them from seed any more.

*Supplemental Information to the Above Theory

Now that I have about a dozen years' experience growing my Green Mountain strain of Potato Onions, I can safely say that in each year of successive cloning, the tendency for them to throw up seed stalks becomes rarer. Now that I am into my 2013 growing season, it is very plain to see that my Green Mountain Potato Onions, cloned now for about a dozen years, only have an occasional seed stalk, whereas my newest strains of white, yellow and pink Potato Onions have many, many seed stalks. The Dakota Red Potato onions given to me by a fellow gardener from North Dakota do not have a single seed stalk. Yet, all these different varieties are planted in the same garden and have received exactly the same treatment. It is therefore obvious that a Potato Onion will readily produce true seeds during its first decade of cloning, and gradually become less prone to produce any seed after about a dozen years. So, the question of how to stimulate an old, heirloom variety of Potato Onion to flower is still not fully known to me. (note added late fall 2018; my Green Mountain strain no longer produces flowers at all.)

Extinction of Many Types of Old Varieties

Evidence shows that some old varieties of Potato Onions are probably now extinct. Old books mention at least three varieties - red, yellow and white. There were probably also different cultivars of these three colors. Some sources on the Internet claim that the reds and the whites have disappeared leaving only the yellows. Even the yellow ones have become quite rare.

It is easy to understand how they went extinct. When great grandma got too old to tend her garden anymore, she had no one who was interested in perpetuating her old red Potato Onions. Great grandma's old red onions died along with her.

But even great grandma, who had been cloning her red Potato Onions for the last 50 years of

her life, probably received her Potato Onion starts from her grandma, who had been cloning them for 50 years before that! I don't think I'm exaggerating when I claim that if someone today obtains some Potato Onion starter bulbs from Ronniger's, Southern Exposure Seed Exchange, Territorial Seed Company or through another gardener in the Seed Savers Exchange, those bulbs have already been cloned for 100 years or more!

Can You Really Clone Potato Onions 100 Times?

There is some controversy about that question. The cloning of animals is quite new and geneticists claim that the telomeres on the ends of the DNA strands deteriorate. Some claim that because of the deterioration of the telomeres, a cloned animal will have a shorter lifespan than the mother animal.

But greenhouse growers and horticulturists claim this does not apply to the Plant Kingdom. Many ornamental plant varieties are sterile and must be multiplied by rooting-up cuttings. Also, many orchardists will take scion wood from one tree and graft it into other rootstock to create huge orchards. It is commonly accepted among experts that plant material can be perpetuated into futurity unless it becomes infected with diseases, mainly viral diseases.

The farming of potatoes comes to mind here. In order for a potato farmer to have a good crop in the next year, he must "clean up" the diseases in his planting stock. If the diseases are not cleaned up annually, his yield in the following season will be diminished. These diseases will actually accumulate and become progressively worse year after year if not cleaned up on an annual basis. (This is the reason the seed potatoes you buy at the nursery are "Certified Disease Free" planting stock.)

Breeding a New Variety of Potato Onion

After I developed my original **Green Mountain Potato Onion**, I was quite proud that I had increased the size of the bulbs at least three-fold. I thought I was quite "cool." But something still puzzled me. I wondered why *ALL* of my phenotypes I was constantly culling were *ALL* three times as big. In my mind, I wondered why I didn't see any phenotypes that were small, as small as my old Ronninger's Yellow Potato Onions I started with.

Besides my Green Mountain strain, I have also been trying to multiply-out a pure white Potato Onion, and even this white Potato Onion is three times as big.

I really am not an expert breeder. I am actually quite ordinary and have just stumbled upon these superior Potato Onions simply by experimenting with the unknown. The sudden increase in size is actually quite mysterious, unless.....

Diseases Can Cause Decrease In Size and Productivity

I have no way to analyze Potato Onions for viral disease accumulation. Because Potato Onions are not grown commercially, I really doubt that anyone has done any lab analysis to find out. But, shallots *are* grown commercially, and the Hannover study states that one of the reasons commercial growers want true seeds is to help control diseases which can accumulate in the bulbs.

My theory, which I am wholly convinced is true, is that by starting over with true seeds, I have been able to totally "clean up" any accumulated diseases in the next generation. I'm sure if anyone wanted to do some lab analysis of viral diseases, the results would bear me out.

I believe, therefore, that my Green Mountain Potato Onions are not three times as large because of any breeding success, but are three times as large because they have been cleaned from 100 years of virus accumulation. (My thanks go to the growers at Pineae Greenhouses and to Royal Heins of Oro Farms to help me come to this conclusion.)

Obtaining True Seeds Is Key In Perpetuating Future of Potato Onions

I really believe there is a bright future for Potato Onions after a century of neglect. But this bright future depends upon acceptance by a wider audience. This audience is not interested in Potato Onions that are "thumb size" as one seed catalog describes them. That audience wants onions that are at least three times their "thumb size." That audience will also be interested in more than just the yellow ones that are currently available. They might like to try the red and white ones mentioned in those old gardening books.

If you were observant, you caught my sentence where I mentioned the white Potato Onions I am multiplying out. Well, let me introduce my next section by telling you I also have developed a red one. Yes, if you were observant, you will note that I currently have all three of the colors mentioned in the old gardening books, and they are no longer extinct, because I have resurrected them. I am working on red, yellow and white Potato Onions that are at least three times larger than any currently offered.

I also believe the future of Potato Onions lies in the hands of home gardeners who are willing to do a little breeding work themselves. In the process they will be able to clean up the viruses and increase the size and assortment of colors of the bulbs. They can share their bulbs with other gardeners who can do the same, all while enjoying the ease and sustainability of raising Potato Onions as compared to normal garden and store-bought onions.

I will next tell you how you might be able to do this yourself, and what to expect.

Breeding Your Own New Varieties*

***Please take note of day length and latitude where you live; information I have been receiving from other gardeners around the country is that different varieties of Potato Onions are day length sensitive, and might not bulb-up if you live in southern latitudes like in Arizona, Texas, Florida, etc. Please see my 2013/2014 gardening journal towards late fall where I start to address this issue.**

You cannot breed new Potato Onions unless you can first get at least two or three flowers. You may never see any. In this case, you are just out of luck. But if you do see some flowers forming, do *NOT* pinch off the flowers.

Many gardeners will religiously pinch off the flowers from their normal onion crop, because the flower will draw energy away from the bulb. After flowering, the bulb often becomes inedible, becoming tough and dry. These gardeners are, of course, trying to save their bulb for eating by eliminating the flower stalk. I have even read where growers of Potato Onions will recommend pinching off the flower.

First of all, you might or might not be able to eat the bulb anyway. Potato Onions send up a flower stalk from the BASE of the bulb, not from the bulb itself. Here is a picture of a flower stalk emerging from the base of the bulb.

When Potato Onions *do* flower, they will send up a flower stalk from the base of the roots. The bulb itself is, more often than not, quite edible. Sometimes the texture is a little bit “tougher” which is probably because the stalk was in competition with the bulb for water and nutrients. I ate this particular bulb, and it was just fine.

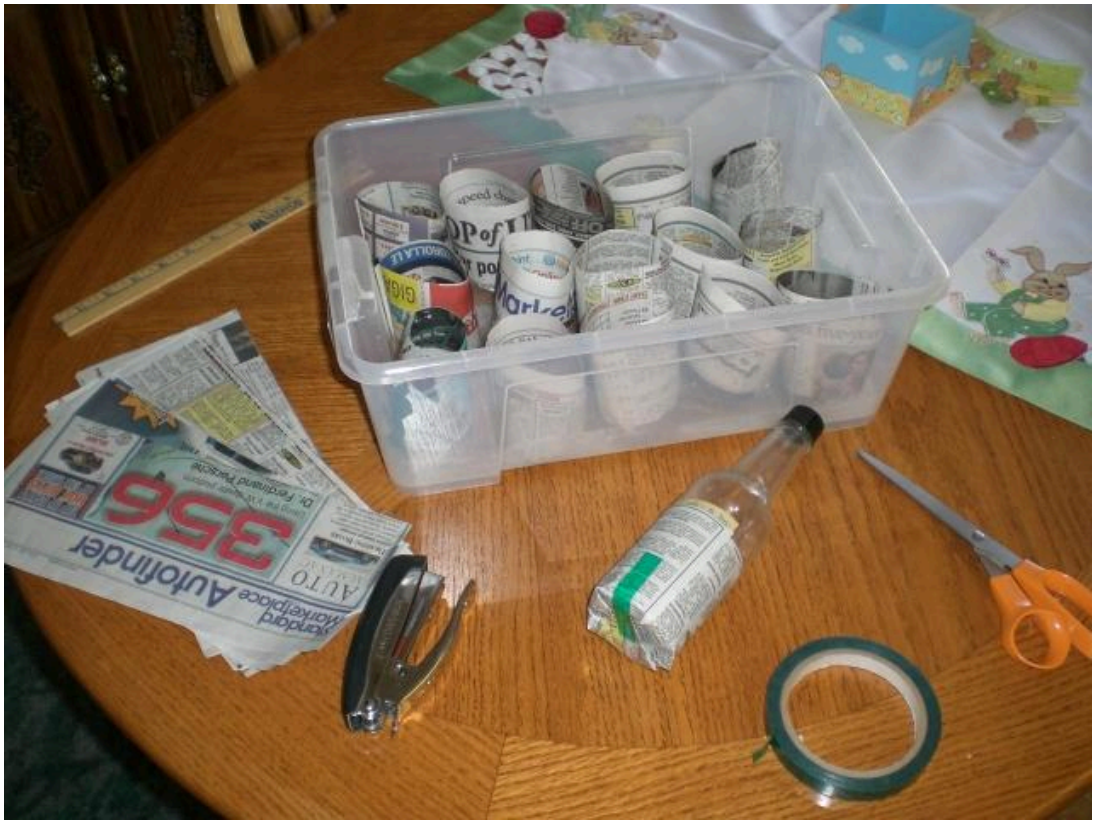
This picture is a little more clear than the previous picture. These two bulbs are from my Green Mountain variety in the year 2012.

But when you do see a flower stalk emerging from your nest of onions, the other Potato Onions in the nest will be perfectly fine for eating. So, please do not succumb to the old wisdom of pinching your Potato Onion blooms. You really *do* want to see if you can harvest some viable seed. If you can get some viable seed, the seed will be worth far more than your tough bulb!

(One question has been posed to me: Will Potato Onion flowers cross-pollinate with normal garden onions or Leeks? Or even shallots or garlic? I don't know! If they do, what kinds of unique onions might result from such a cross?) (I have since ruled-out the possibility that Potato Onions will cross with leeks and/or garlic.)

If you do get some true seeds, be prepared to treat these seeds differently than your normal Potato Onion crop. The seeds will need a longer growing season, much longer than your spring-planted Potato Onion bulbs.

You might already have a method that works well for you, but I will describe my method. I start my seeds in newspaper pots under grow lights as early as February. I give them a weak fertilizer about once per week. About the middle of April or the first of May, I put the transplants out into my garden - newspaper pot and all.



Just a little picture of how I roll my own newspaper pots. I fill the newspaper pots with seed-starting soil mixture. When it's time to plant them in the garden, you can plant the whole pot!

Normally, Potato Onions are a quick-maturing crop, but ***not*** when you start from seed! This is why I get a head-start on their growing season by starting them early indoors under my grow lights.

After hardening them off, plant the transplants into the garden up to three weeks or so before your last frost is expected. If the frosts are not severe, the transplants should be just fine. But, depending upon your climate, you may also wait until the weather is a bit more settled. Once they are growing in your garden, treat your Potato Onion transplants just like you would treat normal garden onions.

As your Potato Onion seedlings grow, you will probably see any number of differences in their phenotypes. Most will only grow one large bulb - and I mean LARGE. They will be much larger than a normal Potato Onion grown from a bulb. Remember, Potato Onions are a true biennial,

meaning they will grow one large bulb the first year from seed, and in their second growing season they will multiply. But, you might also see some of your Potato Onion seedlings divide into large double bulbs. I have experienced a rare one that will divide into 3 or 4 large bulbs in the first year. So, don't be surprised to find that no two seedlings might be the same. These will act like an F2 generation, and you might even get different colors.

Yes, you saw this picture previously. But this is what you can expect to see if you grow Potato Onions from true seed. Note the huge size and the difference in colors.

At the end of the growing season, dry and cure these large Potato Onions for storage until next spring. Next spring you can again plant this large bulb into the garden where it will divide into a nest like you are used to seeing. You can now start the selecting process of creating your own new variety of Potato Onion! You might want to select for a white one, or a red one, or maybe you will get something hitherto unseen and unknown! But, I can almost guarantee your new strain will be much larger than those little "thumb-sized" ones you started with.

If you live in a warm climate, I suppose you could simply leave your first year Potato Onion seedlings in the ground for the winter, rather than drying and curing them in the fall and storing them in a dark, cool place through the winter. But my mountain valley gets quite cold, so I elect to store mine in my basement.

Some of My Current Breeding Projects

During the 2010 gardening season, I got six Potato Onion flowers from approximately 60 nests. From these six flowers, I was able to get about 40 or more viable seeds. I sent a few of these seeds to Geoffrey Larbalestier in England via a son who lives in USA. In February of 2011, I planted 20 newspaper pots with two seeds in each pot, and when I got both seeds to sprout, I thinned out the weaker of the two. These 20 Potato Onion seedlings grew very well this summer, and I was thrilled, almost to tears, as I saw the top of a **red** bulb expanding above the soil line!

About 12 years ago, in my first attempts to grow Potato Onion seedlings from true seed, I only saw pale yellow skins and white skins. But this year I got a couple of red ones! I am surprised at the diversity of the gene pool that must be locked up in those original Ronniger's Yellow Potato Onions. In that gene pool are apparently enough genetics to be able to resurrect all three of the colors that were reported in the gardening books of the 1800's. (Those red ones were not necessarily the best. I did, however, get a great PINK variety which I named Coral Mountain.)

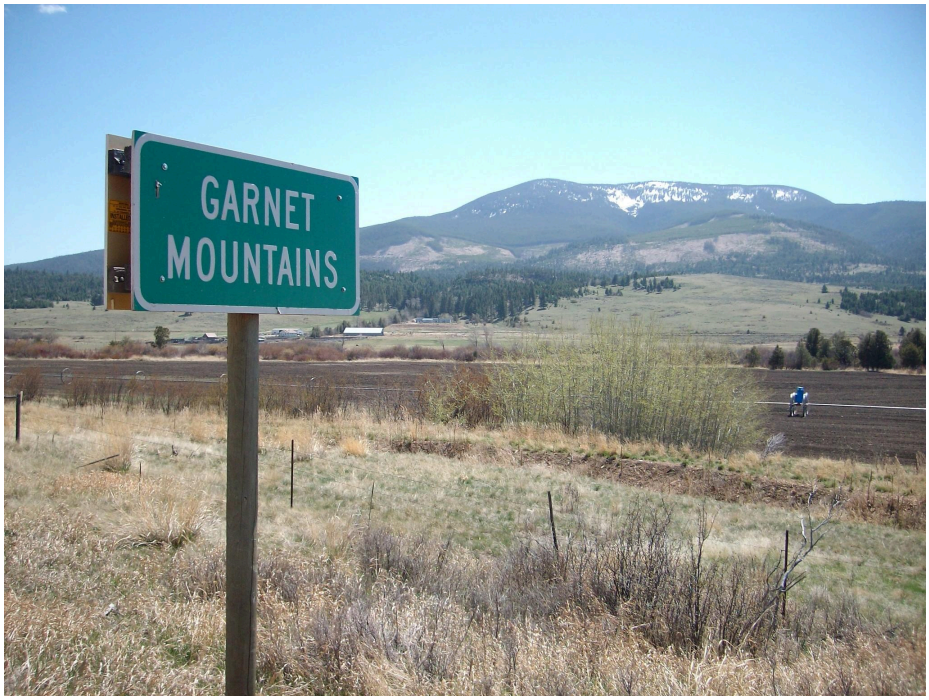
I'm not sure of the exact color of the reds from the 1800's. How "red" were they? My red ones are kind of a reddish-brown color and perhaps they resemble the red ones of the 1800's? Below is a picture of my 2011 trials, showing the three colors. **(note from August 2012; I suspect that if I had cut into the red bulbs, I would have discovered the interior to be purple and white ringed. But I assumed then only the skins to be red, and the interior to be white. I am also now assuming the old "red Potato Onions" of the 1800s were also purple and white, and simply called "red.")**

At the left are three reds. One was a large single, and the other two were actually a double from one seed. In the middle is a pure white one, and on the right is a yellow one.

I really have high hopes for these in my grow-outs in the upcoming 2012 growing season. If these perform as well as I think they will, I will be able to multiply out all three of the old colors in a cleaned-up form yielding large Potato Onions!

I already have tentative names picked out for them.

- I had to go through a learning process on “red” onions. As a child, my parents called those purple and white ringed onions “purple” onions. It has only been recently that I learned most people actually call those purple and white onions “red.” To my defense, Wikipedia even says that some people call the “red” onions purple onions. I have now come to the conclusion that the old gardening books that mention a “red” Potato Onion actually referred to a purple and white ringed onion. Not knowing what to name my purple and white ringed Potato Onion, I have finally settled upon the name **Garnet**. Garnet is a reddish gem, and the street these were bred at is named Garnet Drive, location of my home.



While traveling through Montana, I stumbled upon this sign, and it gave me the inspiration to call my new red ones **Garnet Mountain**.

- For the white one, I would like to call it Snowy White. My garden is only five miles away from Snow Basin Ski Resort, so this name would reflect the proximity to Snow Basin. (After growing out my white ones in 2012, I have been disappointed in yield and rough appearance. I am going to discontinue these, searching for a better-performing white-skinned phenotype. I have now decided to call a new selection of white ones **White Mountain**.)

- The yellow one I'd like to call Utah Gold. I was going to call it Utah Yellow, but I have since seen some Allium Cepa Spanish onion seeds called *Utah Yellow*. But keeping with the theme of "Mountain," I will probably call this one **Gold Mountain**.

- I also have one that is pink and white ringed. Now that I have grown some of these pink ones in 2013, I like these more and more. They stored well through the winter, and they form quite large bulbs. I would like to call these pink ones **Coral Mountain**, because the name Pink Mountain just doesn't seem "manly" enough for me! Coral is usually associated with a pinkish to salmon-color tint.

I don't know where I'm headed after doing the selections for these varieties. I will be posting more about the ongoing process during the growing season of 2012.

Besides those promising varieties pictured and described above, I also have a bunch of other phenotypes of straw-colored or off-white colors. These might show promise as I multiply these

out as well. Some may be larger, smaller, more productive, less productive or have better storage qualities. I will not be able to evaluate those differences until these are grown next season. I might be able to find other qualities to recommend them besides those three with the exceptional colors.

Conclusions

I hope I have been able to inspire others to walk in my footsteps. I can't make a bright future for Potato Onions all by myself!

If ***you*** are growing Potato Onions from some other source, your Potato Onions might have different (maybe even better) genes locked up in yours than I do in mine. This is another reason to encourage others to try to duplicate what I am doing.

Some old gardening books mention that Potato Onions have a mild flavor. My Potato Onions are fairly pungent. Your Potato Onions might be milder than mine. You might could be the one to develop a line of milder-tasting Potato Onions.

I am currently working on a new theory, which I believe explains many unanswered questions about Potato Onions and shallots. I am currently of the opinion that the more pungent the Potato Onion tastes, the longer it can last in storage, and the milder the Potato Onion tastes, the shorter its storage life is. Taking this theory one step further, I am also suggesting and theorizing that Potato Onions and shallots are indeed the same exact thing; the difference being that a pungent-tasting bulb will be called a Potato Onion, yet a mild-tasting bulb will be called a shallot. Yet I believe that there is ample middle ground between Potato Onions and shallots. This means that there ought to be genetic variations of Potato Onions that taste milder but don't store as long, and genetic variations of shallots that taste more pungent and have better storage qualities. I am also suggesting that perhaps Potato Onions and shallots can possibly hybridize, creating different cultivars spanning the gamut from pungent to sweet.

Our ancient ancestors have done us a great favor by constantly breeding and improving wild edibles into the delicious vegetables we now enjoy. Potato Onions were part of this history, so it would be a shame to see the centuries of improvement suddenly go to waste. Potato Onions came close to being extinct, so let's don't let modern agriculture deliver the final blow to them. The centuries of breeding and improvement of Potato Onions now lies directly in the hands of amateur gardeners like you and me.

Check back on me later - - I'm not done with this yet!

kellysgarden@gmail.com

Growing notes from 2012

April 18, 2012

The early arrival of good spring weather has allowed me to get out into my soil much earlier than normal here in Mountain Green. I have roto-tilled under the barley crop I planted last fall as a cover crop, as well as worked in a bit more compost and other organic material I had on hand. I am getting anxious to plant the next crop of Potato Onions into the garden.

I went to my basement storage room to retrieve the Potato Onions from the wire shelves I built especially to store my onions on. I needed to count how many bulbs I will plant so I can plan out my spacing of rows as I prepare my garden for spring planting.

I have saved out a total of 68 bulbs of my Green Mountain variety for 2012's crop. If I can achieve an average of 5 bulbs per nest (68 nests total), this should yield around 340 bulbs. If I save out about 70 from those 340 for my future crop in 2013, this should leave around 270 total bulbs to share on the Seed Savers Exchange and with other interested people.

I also am just now multiplying-out my new white variety (anticipated name of Snowy White) and I have a total of 27 of these bulbs. Using my average yield of 5 bulbs per nest, this should yield approximately 135 bulbs. But, I will also hold out about 70 of these bulbs for my 2013 season, so I should have around 65 of these Snowy White Potato Onions to share with others.

Observations on Storage of Green Mountain and Snowy White

I have been quite impressed at the storage ability of my Green Mountain Potato Onions over the last few years. They are put into my basement shelves in October, and are usually stored there until mid April. (About 5 and one half months.) This year, as in other years past, there are usually about 15% of the Green Mountain bulbs that have just started to break dormancy. This indicates to me that the *average* storage life of Green Mountain is over 6 months (up to 10 months is not uncommon for the best-storing bulbs).

But, when removing my Snow White Potato Onions from the storage shelf, there were not ANY of the 27 bulbs that had started to break dormancy at all. These white Potato Onions are longer-storing than my Green Mountain variety.

Observations on Trial Potato Onions

Also on my storage shelves were my trial Potato Onions from true seed that were grown during the 2011 growing season. (Reference the picture of the red, white and golden bulbs above.) In addition to my lovely red, white and golden Potato Onions, I also had an assortment of straw-colored bulbs.

The lovely white Potato Onion did not store well whatsoever. It had gone mushy inside, so I culled it by feeding it to my chickens. There was also another bulb of straw color that had not stored well over the winter. Some of the other straw-colored Potato Onions stored well, but a few were already breaking dormancy. But, I am relieved to find out, the beautiful red and lovely golden Potato Onions have stored perfectly, being hard as a rock and no sign of breaking dormancy. The prospects for the red and golden varieties look very good indeed! While disappointed about that beautiful white one pictured above which went mushy, I do have the other white ones that, so far, are the best-storing ones.

Also noteworthy, was one peculiar phenotype in my trials from true seed. This one seed grew into *six* distinct bulbs in its first season of growth from seed. This was unusual compared to others I have grown from true seed. (Usually in the first season of growth from seed, only one or two bulbs will be formed, and rarely a third.)

This first-year seedling was an anomaly, forming SIX bulbs in its first year of growth (taken fall 2011).

This 6-bulb onion, was attached by a common root system, and I left it in this 6-bulb cluster all winter long in storage. But today I broke it into 6 separate bulbs and cleaned off the old, dried skins to find that within each of the 6 bulbs were additional “clove-like” divisions. This one seed had grown into about 12 or so separate bulbs in its first year of growth! I will plant each of these clove-like divisions to see what kind of phenotypes it will yield! This could prove interesting!

I have a total of 51 trial bulbs from seeds to plant out this year to start the evaluation process. I am quickly getting to be maxxed-out in my ability to grow and evaluate so many phenotypes. I have realized one of my dreams of “resurrecting” all the lost colors of the old Potato Onions - red, yellow and white. In addition, I also have my “green” one. Do I really want another dozen types of straw-colored ones?

Would There Be Any Interest For Others To Experiment With My

Straw-colored Ones?

In the fall of 2011, I ran out of bulbs to share. Many requests for starter bulbs at the end of 2011 and the spring of 2012 went unfilled. I'm sure they were disappointed; but what could I do? Some requesters were pretty serious, and I hope they will remember to ask again in the fall of 2012.

But this has led me to wonder if others would be interested in taking some of the many phenotypes, as yet totally untested and unnamed, and experiment with them for themselves? If they liked what they grew out, they could name that new variety themselves and introduce it to friends, neighbors and others around the world. This could be a real boon to the awareness and popularity of Potato Onions in the future. It would be too bad to think of some unique genetic combination being culled by me and my chickens, when they could be of more value to someone else wanting to gamble a little bit!

If such a project seems interesting to you, contact me in the fall of 2012 to see if I have any culls to share with you! (There WAS great interest in these, I shared and sold every one of them!)

But How Do They Taste?

One of my as yet unproven theories is that the attributes of flavor and store-ability are interrelated. This is unproven so far, simply because I have shared or trialed *every* bulb, and not eaten it to evaluate taste. Now that I know there are differences between my Green Mountain and Snow White varieties for length of storage, I can start evaluating these for taste as well.

In my trial bulbs, I can definitely see that some bulbs are now beginning to break dormancy to varying degrees, while others are still in a dormant state. But, I don't have enough bulbs for taste-testing! (Can't grow and multiply a bulb I've already eaten!) If my theory holds, the earlier a bulb breaks dormancy, the sweeter it will taste; and, the later a bulb breaks dormancy, the more pungent it will taste.

Because of my preferred planting method of planting only my best-storing bulbs in the spring, I might therefore be selecting for bulbs that could have a more pungent flavor. But, if others got some of my culls, they might could get a Potato Onion that has a sweeter, milder flavor, yet doesn't store as well. These bulbs might actually be preferred if someone were in a milder climate (warmer zone) and they preferred to plant in the fall. This reason alone might justify someone playing around with some of my culls.

April 21, 2012 Planting Day!

Starting to plant my trial bulbs! Big bulbs, little bulbs, red bulbs, gold bulbs, some still dormant, some not. Should give me lots of phenotypes to evaluate!

Observations as of July 18, 2012

By July 18, the growth and size of the daughter bulbs is almost completely at their maximum size. My Green Mountain variety is actually starting to die back already. This attests to how quickly these have matured from their original planting-out date of April 21st. Within this short time period of about 85 days, they have put on all their growth, and are now entering into their dying-back stage when the new bulbs will enter into their dormant, storage stage.

This picture taken on July 18, 2012. Tops are starting to fall over as they enter into their dormant stage. These are my Green Mountain Potato Onions, and you can see that very few of these sent up seed stalks.

Good crop of Green Mountain onions this year. (July 18) Many nests have up to eight large bulbs. Please excuse the weeds!

I have had the chance now to taste a Green Mountain bulb and a Snowy White bulb to test my

theory that longer-storing bulbs might taste more pungent than shorter-storing bulbs. It sure might be true, because the Snowy White Potato Onion tastes not only more pungent than the Green Mountain Potato Onion, but the Snowy White is also a bit less juicy, or drier. It makes sense in my mind that a juicier, wetter onion would not store as well as a drier one.

But the biggest and most important observation in the 2012 crop of Potato Onions is the mass flowering event that is taking place!

These are my trial bulbs in their second year from true seed. Potato Onions are more apt to flower when they haven't been cloned before.

I have not seen this many flowers since a dozen years ago when I first saw all my Potato Onions go to seed. The weird thing is that a few other people have corresponded with me that their Potato Onions also have gone to flower this year! Just why they decided to go to seed this season when last season they did NOT go to seed is unknown to me. It makes me want to put on my tin-foil hat and wonder if the earth rhythms have changed, or if Potato Onions have some circadian clock they listen to!

The flowering among my first-year from seed trials is almost 100%. The flowering among my Snowy White Potato Onions is about 60%, and the flowering among my Green Mountain Potato Onions is only about 30%. This observation gives credence to the theory that the more years a Potato Onion is cloned, the less apt it is to produce seed. (This note fall of 2018; my Green Mountains no longer produce flowers at all.)

In any event, I will have a couple thousand true Potato Onions seeds available to share with people this season. Perhaps you might want to play around with some true seeds in your own garden to develop your own varieties.

I have refused to mail starter bulbs to people outside the USA and Canada because of the laws and restrictions of sending them across borders. But, it ought to be a simple thing to mail a few true seeds overseas to other countries.

A Quick Observation on July 19th

I have read that onion flowers are not very attractive to most pollinators. Yesterday I walked by my Potato Onion patch and I could definitely smell onions in the air. Tonight while weeding among my Potato Onions, I noticed a black fly, looked just like a normal house fly to me, happily walking all over the blossoms. (I have since noticed even more flies walking around around on the onion blossoms.) (Another curious observation; flies are usually very skittish, flying at the first sign that your hand is getting too close to them. However, when walking around on the onion blossoms, these flies seemed oblivious to me getting right up close to them! These flies were apparently pretty focussed on the blossom! Do they feed on the pollen? I had the impression that they were trying to find a way into the interior of the umbel, but couldn't get into it. Maybe they were after the smell emitted, thinking they could get to the source if they just found a way into the interior of the umbel!) Another observation, but later in August: the wasps are increasing in number as the fall advances, and I noticed a number of wasps visiting the umbels. Never any bees, though. (One person has Emailed me wondering if these might not have been house flies, but possibly Carpenter bees or Mason bees. When I look at pictures on the Internet of these native bees, this just might have been the case. There are some pictures on the Internet that do look surprisingly like house flies.)

It is easy to see which flowers in the umbel will have viable seeds. Viable seeds will be within the swollen, green pods (ovaries), whereas the dried and shriveled flowers will have no seeds.

Observation on August 10th

This time of year the upper leaves are getting pretty dry, and the roots are pretty brittle or even dead. Many bulbs are actually just sitting there on the surface of the nest, and the slightest disturbance from passing feet will dislodge a bulb from the nest. Needing an onion for cooking, I took one of these orphaned bulbs from my row of trials into the kitchen. The outer dry skins were a medium brown, but removing the dry outer skin revealed a light purple and white ringed interior! (This has since become my Coral Mountain variety.) But, it is only now that I am suspecting that the “red Potato Onions” mentioned in the old gardening books were not simply red outer-skinned with a pure white interior, but actually a purple and white ringed interior. I am only now, in my advanced 57 years of age, realizing that those purple and white ringed onions at salad bars are commonly called “red onions!” As a boy I was raised to call them “purple onions!”

Some Statistics

I have now harvested my Green Mountain ones, they mature quicker than the others. Here are some statistics.

I planted 68 Green Mountain bulbs, and from these 68, I harvested a total of 506 bulbs. This works out to be an average of 7.5 bulbs per nest, or a 750% increase. The total weight of the 506 bulbs was 98 pounds, or an average of 3.1 ounces per onion. I thought this was pretty good! A couple of the nests had as many as 11 bulbs, a few had up to nine. Bulbs varied in size, of course, some quite large and some on the small size. Below is a picture of a few of my nicest bulbs.

These Green Mountain Potato Onions are approaching a normal onion in size! Much larger than the “thumb-sized” Potato Onions sold by other seed companies. Each of these bulbs were over 6.5 ounces each.

Of the 506 Green Mountain bulbs, I will reserve 72 for myself. These 72 will be my planting stock for the 2013 season. That will leave a total of 434 bulbs that will be available for sharing.

New Discovery August 25th

While collecting seed heads in my trials section, I found one seed head that did not have ovaries like all the others. This “seed head” had bulbils instead! (Picture below) The possibilities started coming into my head … could this be something new and exciting? How about a topset Potato Onion, or a “Walking Potato Onion?” Or, perhaps an Egyptian-type walking onion that has been cleaned of viruses and will now produce extra, extra large walking onions? A perennial, topsetting Potato Onion for warmer climates? (September 3rd, these little bulbils are planted, rooting up quickly, and growing under my grow lights. This will be fun. September 15,

they are still growing well, shoots now 3 inches tall.) (December 8, I have a total of ten of these bulblets growing under my grow lights. These have become quite large now. These should transplant into the garden quite well sometime in April of 2013. I am still very optimistic for some kind of a topsetting Potato Onion! Time will tell!)

I am growing out these bulbils to see what I get!

(Here is an update on those bulbils. I have been able to get ten of these bulbils to grow quite well all winter long under my grow lights. It is now February 2, 2013 and they were getting so big I had to transplant each into its own individual 9 ounce drinking cup. Below is a picture. I plan on transplanting these to the garden after the snow melts in April. If these turn out to be unique, something like an Egyptian Walking onion only better, I plan on naming these Mountaintop Potato Onions due to their topsetting nature.) (They never performed or worked out :-(.)

Photo taken February 2, 2013

Hard Decision To Make

My white Potato Onions have now been harvested from the garden, but I was disappointed in them. To the side of my Green Mountain ones, these are not nearly as nice, or prolific. (They are white and they are big, though.) I have made the hard decision to end the trial of these white ones. I am hoping for a more desirable white phenotype when I dig into my two rows of trial Potato Onions. I have decided to offer these less-desirable white ones to others who might have an interest, or I will eat them myself. Color isn't everything - they have to perform, too. Here are the stats: From 27 starter bulbs, I harvested 131 bulbs, or an increase of 422%. The total weight of these 131 bulbs was 35 pounds, or an average weight of 4.27 ounces per bulb. (By comparison, my Green Mountain ones increased by 750%, but average weight per bulb was slightly less at 3.1 ounces per bulb.) See pictures of my white crop below:

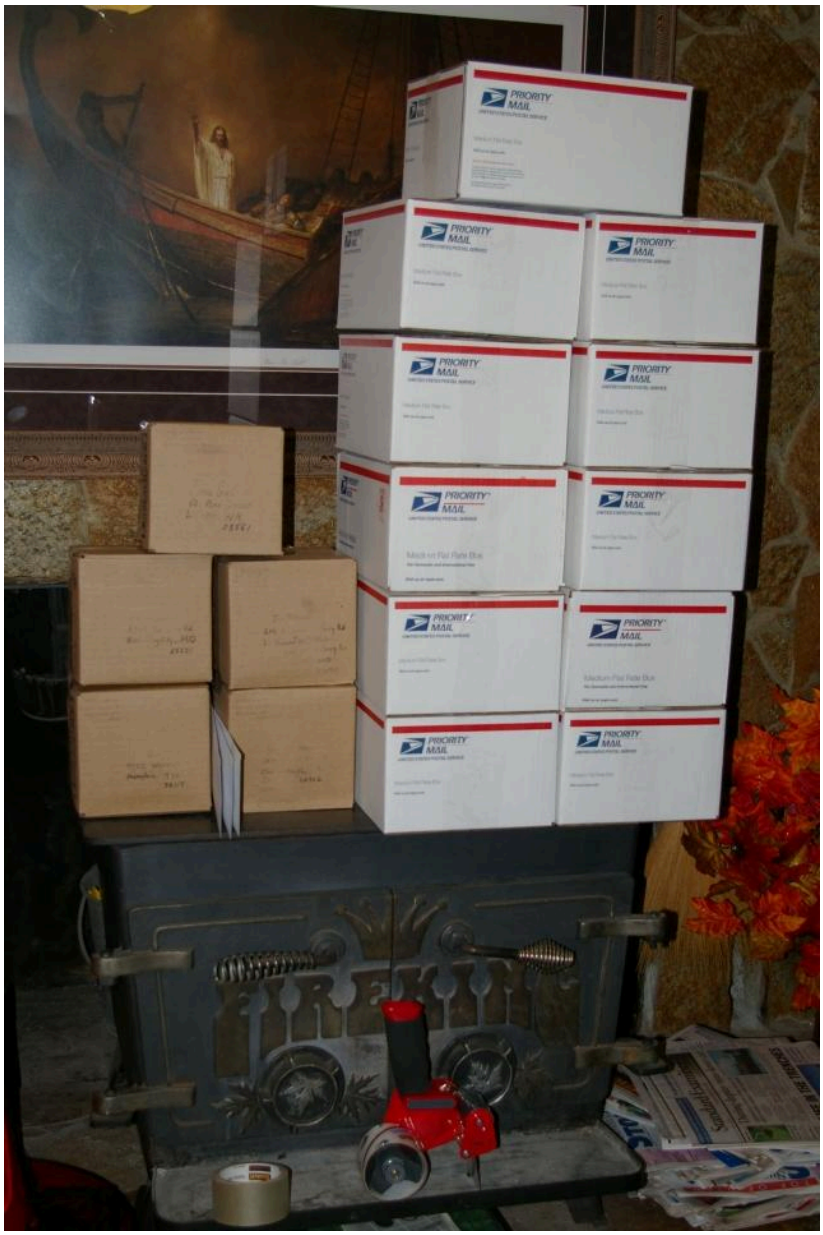
As you can see, the white ones are nice and big, but see the next picture...

The white variety has a fair amount of double and triple bulbs that are wrapped in the same outer skin. The papery divisions are thick and rough, and start to deteriorate quite quickly, becoming soft and slimy. The single bulbs really

are quite good, but the trait of poor doubles and triples leads me to believe some of my other white ones could be better performers.

SHIPPING DAY!

I have been swamped and overwhelmed! I have been busy boxing and packing Potato Onions and true seeds. I wasn't quite ready for this! My supplies are running very low now, except for the true Potato Onion seeds, of which I will have plenty. Below is a snapshot of one of my packaging evenings!



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I am also working on a couple of other possibilities for the spring of 2014. First is the aforementioned top-setting Potato Onions, but I am not sure if or how these might work out. But I am very excited for another idea that I could offer to those people living in the continental 48-states of the USA - that being the possibility for me to sprout true seeds and grow them into seedlings and actually mail living F2 Potato Onion seedlings to you. These, unlike true seeds, could be guaranteed to grow for you. I could use my ample true seed supply to sprout these in the late winter/early spring of 2014 and grow these in my hobby greenhouse in order to have them ready for planting in your garden by about April of 2014.

In the meantime, please be sure to keep up with my on-going Potato Onion booklet which you can find on my personal, little website at:

http://kellysgarden.googlepages.com

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Instead of putting my **2013** Potato Onion journal on this document, I am going to continue my new observations on a new page. If you want to continue reading about my new thoughts and observations, please go here. (I encourage you to scan through my 2013 journal, because I have included at the end some new thoughts and theories for your consideration, some of which are new to my previous theories. Some of these thoughts concern day length response of bulbing-up.)